Claims

1. The device for conversion of wave energy into electrical energy wherein the device comprises a supporting construction (50), consisting of buoyancy elements (52) with a supporting tube (51) fixed to the top of the supporting construction (50), wherein it comprises a joint gear (30); having a gliding connection on the inner circumference with the outside surface of the supporting tube (51), while a sphere (32) is hinged or tightly fixed at its outside circumference to a floating body (20) whereby the device has two gears, the first, flexible gear (1) used for connecting the floating body (20) to the second gear wherein the flexible gear (1) comprises a flexible element and at least two pulleys (6b, 6c), whereby the two pulleys (6b, 6c) are fixed to the supporting tube (51) by means of their supports above the end point of the working stroke of the floating body (20) so that they can rotate and a middle pulley (6a) is by means of its support fixed to the second gear that connects the flexible gear (1) to an electrical generator having additional mass (12) connected with a lower tube (53) of the supporting construction (50) in the sliding manner while the flexible element of the flexible gear (1), e.g. a cable, is coupled to the floating body (20) at one end, then passed over one of the two pulleys (6b) and over the middle pulley (6a) inside the tube (51) and the other of the two pulleys (6c) and by the other end again connected to the floating body (20) or the flexible gear (1) is composed of two identical flexible elements having one end attached to the floating body (20) and one flexible element of the gear (1) goes over one of the two pulleys (6b) while the other flexible element of the gear (1) goes over the other of the two pulleys (6c); and by the other end they are mutually connected by a lever pivotally attached to one end of the second rigid gear and the connecting points of the flexible gear (1) and the floating body (20) as well as the two upper pulleys (6b, 6c) are mutually opposite and wherein at the end of the buoyancy element (52), at the upper tube side (51) ~~the~~ a casing (80) is placed and flexible ropes (71) are at one end attached to the buoyancy element (52) and to the floating body (20) at the other end, whereby the supporting construction (50) is by ropes (63) coupled to an anchor weight (67) that can be positioned in a bearing in an anchor base (61).

2. The device of claim 1, wherein the additional mass (12) for balancing with the mass of the floating body (20) and adjusting the movement of the floating body (20) on the waves is at the lower side attached to the second gear.

3. The device of one or more preceding claims, wherein it comprises a device for braking the floating body (20) consisting of flexible ropes (71), made up as monolithic or composite from synthetic materials, one end attached to the bottom of the floating body (20), and the other end fixed to the buoyancy element (52).

4. The device of one or more preceding claims, wherein the anchor weight (67) is made of concrete and placed in the anchor base (61) produced in the form of a hollow construction filled with water when the anchor base (61) is at the anchorage location.

5. The device of one or more preceding claims, wherein the floating body (20) consisting of a steel frame (21) and having a closed chamber (22) is coated with foam coating (23).

6. The device of claims 1 and 2, wherein the floating body (20) is constructed as self- submerging floating body so its mass is bigger than its volume that provides its buoyancy.

7. The device of claims 1, 2 and 6, wherein the added mass (12) keeps the floating body (20) on the water surface and regulates its draught depth.

8. The device of one or more preceding claims, wherein the second gear (2, 3, 8, 9), connected with the flexible gear (1) at one end, at the other end with the electrical generator, constructed of elements as a gear (4) and the rack (2) type, or a jackscrew (9) and a nut (7) or sprocket wheel (5) and a chain (3) situated in the lower supporting tube (53) attached to the supporting structure (50).

9. The device of one or more preceding claims, wherein the second gear (8) that is at one side connected to the flexible gear (1), and at the other side to the electrical generator, consists of rigid elements as linear generator type gear and consists of a movable magnet (8) and a fixed, immovable coil (10) and located in the lower bearing tube (53) attached to the supporting construction (50).

10. The device of one or more claims from 1 to 8, wherein the second gear being connected to the flexible gear (1) at one side, and at the other side to the electrical generator, consists of rigid elements as the type of a gear comprising a jackscrew (9) and a nut (7) with recalculating balls and located in the lower supporting tube (53) and attached to the supporting construction (50).

11. The device of claim 10, wherein the nut (7) directly rotates the generator rotor.

12. The device of one or more claims from 1 to 8, wherein the second gear being connected to the flexible gear (1) at one side, and at the other side to the electrical generator, consists of a flexible element consisting of as a chain (3) and a sprocket wheel (5) placed in the buoyancy element (52) of the supporting construction (50).

13. The device of claim 12, wherein the second gear is coupled with the additional mass (12) through the tackle system where the flexible element passes the pulleys of the tackle for connecting to the additional mass (12) made up in the form of a rope, a sprocket wheel or any other suitable form.

14. The device of one or more preceding claims, wherein the device includes an automatic system for activating safety measures of the device.

15. The device of claim 14, wherein the automatic system operates the generator that converts to motor mode when the security measures are activated and increases the added mass (12) to the upper end position securing it and thus leading to self- submerging of the floating body (20) that enters the casing (80) and remains there until the deactivation of the security measures.

16. The device of one or more claims from 1 to 14, wherein the flexible elements (71) ensure that the floating body (20) does not hit the upper part of the supporting tube (51).

17. The device of one or more claims from 1 to 14, wherein the floating body (80) overlaps the casing (80) and slows the floating body (20) down and by hydrodynamic resistance prevents it from hitting the supporting structure (50).

18. The process for deployment on the exploitation location of the device for conversion of wave energy into electrical energy constructed according to one of the preceding claims, wherein the process comprises the following phases:

- assembling buoyancy elements (52) into the supporting construction (50) and placing the additional mass (12) as well as assembling certain parts of the device, lowering the superposed part of the supporting construction (50) into the water by use of a crane and attaching it to a shipyard dock;

- coupling the remaining elements to the supporting construction (50) to the final formation of the device,

- transport by water of the device to the deployment location where the stability of the transport is achieved by the multiplied additional mass (12);

- water transport of the anchor weight (67) with the anchor base (61) so that the anchor base (61) floats acting as a pontoon for the transport of the anchor weight (67) to the deployment location of the device;

- fixing the poles (62) or construction of concrete base for the anchor base (61);

- lowering the anchor base (61) by opening the valves (64a, 64b, 64c, 64d) and filling it with water;

- connecting the anchor base (67) with the supporting construction (50), using ropes (63)

- depth adjustment of the device, ie. adjustment its distance from the bottom of the sea.